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## ABSTRACT OF THE DISCLOSURE

5 The present invention relates to a proton-conducting polymer membrane which comprises polyazoles containing phosphonic acid groups and is obtainable by a process comprising the steps:

10 A) mixing one or more aromatic or heteroaromatic tetraamino compounds with one or more aromatic or heteroaromatic carboxylic acids or derivatives thereof which contain at least two acid groups per carboxylic acid monomer, with at least part of the tetraamino compounds or the carboxylic acids comprising at least one phosphonic acid group, or mixing of one or more aromatic or heteroaromatic diaminocarboxylic acids, of which at least part comprises phosphonic acid groups, in polyphosphoric acid to form a solution or dispersion;

15 B) optionally heating the solution or dispersion obtained according to step A) under inert gas to temperatures of up to 350°C to form polyazole polymers;

C) applying a layer using the mixture from step A) or B) to a support, thus forming a membrane on the support; and

D) partially hydrolyzing the polyphosphoric acid moieties of the membrane from step C) until the membrane is self-supporting.

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